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**United States Patent** [19]

Peairs et al.

[11] Patent Number: **5,694,228**[45] Date of Patent: **Dec. 2, 1997**[54] **DOCUMENT IMAGE PROCESSOR WITH DEFECT DETECTION**5,365,310 11/1994 Jenkins et al. .... 355/202  
5,381,175 1/1995 Sudo et al. .... 348/246[75] Inventors: **Mark Peairs**, Menlo Park; **John Cullen**; **James Allen**, both of Mountain View; **David Stork**, Stanford, all of Calif.*Primary Examiner*—Kim Vu*Assistant Examiner*—Tia M. Harris*Attorney, Agent, or Firm*—Philip H. Albert; Townsend and Townsend and Crew LLP[73] Assignees: **Ricoh Company, Ltd.**, Tokyo, Japan;  
**Ricoh Corporation**, Menlo Park, Calif.[57] **ABSTRACT**[21] Appl. No.: **288,147**[22] Filed: **Aug. 9, 1994**[51] Int. Cl.<sup>6</sup> ..... **H04N 1/409**[52] U.S. Cl. .... **358/538; 358/448; 358/453; 382/172**[58] **Field of Search** ..... 358/448, 518,  
358/445, 447, 474, 452, 453, 538; 382/172,  
168; 348/251, 246, 247[56] **References Cited****U.S. PATENT DOCUMENTS**

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**22 Claims, 8 Drawing Sheets**